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lower Jaw was cut away, yet, according to the Information I have from Mr. Gordon the Operator, it is grown up again, and is of the ordinary Colour of the Skin, and like the other side of the Face ; so that there grows Hair on that side of the Face as well as on the other, which he ordinarily shaves ; and this is as surprizing as any thing in the whole Affair.

I have given a true and plain Account of this extraordinary Case from certain Information ; I have contented my self to relate only Matters of Fact, without making any Observations or Reflections on it ; for I leave it to the Philosophers and *Virtuosi* to make their own Reasonings and Refinements as seems best to themselves.

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## VII. *An Account of an Experiment to prove an inter-spers'd Vacuum ; or to shew that all Places are not equally full.*

**T**HIS Experiment was made before the KING, and HER Royal Highness the Princess of Wales, at Hampton-Court, in the Month of September 1717. afterwards before the ROYAL-SOCIETY, on Thursday, December 5. 1717. and since that, in Channel-Rowe, Westminster, before some Members of the Royal-Society, by J. T. Desaguliers, M. A. F. R. S. as follows.

Having had the Honour to make some Experiments last Year before his Majesty and their Royal Highnesses the Prince and Princess of Wales ; among others, I shew'd that of a Guinea and a Piece of fine Paper ; then of a Guinea and a Feather dropt together from the top of an exhausted Glass Receiver about 20 Inches high ; both

which

which fell to the Bottom at the same Instant of Time : Now since the chief *Resistance* of a *Medium* ( and indeed almost all of it ) depends upon the † Quantity of its Matter ; therefore this Diminution of Resistance, whereby the Feather fell as soon as the Guinea, shew'd a Diminution of the Quantity of Matter, and consequently prov'd an *interspers'd Vacuum*. Some time after this, I was inform'd that some *Plenists* here in *England* objected against the Shortness of the Glass-Receiver ; as if the Difference of Time in the Fall of the two Bodies, which they affirm'd to be real, could not be perceiv'd in such a Glass ; and that some Philosophers from abroad affirm'd that in a Glass Receiver 7 or 8 Foot long, there would be such a manifest Difference in the Time of the Fall of the said Bodies, as to shew this Experiment no Proof of a *Vacuum* ; though at the same time, some of the Objectors well knew that there could be no Receivers of half that Length made at the Glass House, and therefore thought the Experiment impracticable. To obviate this, I contriv'd a Machine for the purpose, which consisted of a strong wooden Frame 15 Foot high, that held the Air-Pump and four Cylindric Glass-receivers of about two Foot long each, and six Inches Diameter : Of these, having set the first upon the Air-Pump Plate, I laid on the Top of it a Brass-Plate of seven Inches Diameter, that had an oil'd Leather fix'd to it above and below, with an Hole through the middle, of between four and five Inches Diameter ; then on that Plate I set the next Receiver, with a like Plate at top ; and after the same manner fix'd the other two with Plates between them : The upper Receiver being a little narrower at the Neck,

† See Sir I. Newton's *Principia*, Book II. Prop. 40.

went into the Hole of a Board, whereby it was screw'd down pretty hard on the other Glasses, and fix'd to the whole Machine. On the top of this upper Receiver I laid the Brass Plate, wet Leather, and Brass Springs which contain'd the Bodies to be dropt.

Having acquainted His Majesty with what I had prepar'd, he order'd me to shew him the Experiment with this long compounded Receiver, at *Hampton-Court*; and when I made it before him and her Royal Highness, he was pleas'd ( by pulling down a String fix'd to a Lever at the top of the Machine ) to let loose the Bodies himself, to see that the Experiment was fair.

When the Receiver was full of common Air before Pumping, the Guinea came to the Bottom, just as the Paper was about the Middle of the second Glass; but when the Receiver was exhausted, the Guinea and Paper came to the Bottom precisely in the same Instant of Time.

Upon my giving an account of the Success of this Experiment to the *Royal Society*, they order'd me to repeat it before them on the 5th Day of *December 1717*, being the *Thursday* next after the Yearly Meeting for choosing Officers on *St. Andrew's Day*; on which Day an annual Experiment is appointed to be made, in Conformity to the Will of their late worthy Member and Benefactor *Sir Godfrey Copley*.

I made the Experiment first with two of the Receivers; then with all the four; dropping a Guinea and a small Piece of Paper together; and the Success answer'd Expectation: But not being willing to try with a Down-Feather, because I fear'd the Air might insinuate between some of the Glasses, by reason the Number of Persons present shak'd the Room, the Society order'd me to make the Experiment at home before one or more of their Members.

*Martin Foulkes, Esq;* a very ingenious Member of the Society, did me the favour to be present when I made the Experiment at my House; where we made four Tryals in the following manner.

The whole Machine being fix'd, as above mention'd, we first let fall a Guinea and two Papers; the one placed over, and the other under it, (before any Air was pump'd out) and the Guinea came to the Bottom when the Papers were only in the Middle of the second Glass from the Top. Then having laid a Feather on the Brass-Springs close by the Guinea, we let them loose both together; and the Feather was fallen only down to the 4th part of the Length of the first Glass or  $\frac{1}{4}$  of the whole Distance, when the Guinea was got down to the Bottom of the Receiver. We then laid two Papers and two Feathers, one of each under, and the other over the Guinea between the Springs; and having drawn out so much of the Air as to bring up the Mercury in the Gage-Tube within a quarter of an Inch of the greatest Height to which it could be then rais'd by the Pressure of the external Air, we caus'd the Bodies to fall all at once: And tho' the Papers came down to the Bottom at the same time as the Guinea, yet the Feathers, being much lighter, wanted about three Inches. But at last, having laid the Papers, Feathers, and Guinea, as before, we pump'd out all the Air, and then the Feathers, as well as the Papers, came to the Bottom of the Receiver at the same instant of time as the Guinea.